Check for updates

Review

Journal of Ethnobiology

Journal of Ethnobiology
1–7
© The Author(s) 2025
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/02780771251325398
journals.sagepub.com/home/ebi
Sage

A Review of Ethnobotanical, Ecological and Lexical Evidence to Identify a Biblical Plant

Amots Dafni[1] and Barbara Böck[2]

Abstract

Since the Medieval period, many translators and commentators of the Bible encountered difficulties in understanding the phrase "dove's dung," in relation to an edible substance, as mentioned in the Book of Kings (i.e., 2 Kings 6:25). We re-examine the suggestions and interpretations used to identify "dove's dung" as a specific plant. Our analysis is based on an exhaustive review of ecological data, geographic distribution of different plants, lexical evidence, edibility, and medicinal uses of these plants. In the literature, the following plants had been suggested as possibly being "dove's dung": *Cicer arienatum*; *Ornithogalum umbellatum*; *Bunium elegans*; *Ceratonia siliqua; Tulipa montana;* and *Prosopis farcta*. Based on all the evidence reviewed, we propose that *Prosopis farcta* is the most plausible identification of "dove's dung." Our proposal draws on the Akkadian names for this species, which are *kabut summati* ("dove's feces") and *zê summati* ("dove's dung"), in conjunction with the edibility, ecology, distribution, and medicinal uses of *Prosopis farcta*, which were the same in ancient Mesopotamia as they are today in the Middle East. All the other suggested plant species, except for *P. farcta*, were based on unreliable philological data and/or are not native to the Holy Land and/or are unsuitable as a substitute for a staple food under siege conditions.

Keywords

dove's dung, Cicer arienatum, Ornithogalum umbellatum, Bunium elegans, Ceratonia siliqua, Tulipa montana, Prosopis farcta

Introduction

The Book of Kings of the Hebrew Bible (found as two books 1-2 Kings in the Old Testament of the Christian Bible) is about the monarchs that ruled over the southern kingdom, Judah, and Israel, the northern kingdom, during the eighth and ninth centuries BCE. Both parts of Israel experienced constant attacks by rebelling vassals and thus were forced to fight against old as well as new foes. The lines in which the plant name—"dove's dung" (in Hebrew, *divyônîm*)—appears, forms part of the account of how the Aramean enemy king Ben-Hadad II attacked Samaria, the capital of the Kingdom of Israel from about 880 to 720 BCE, and surrounded the entire city. The country was already suffering from a drought. As a result of the siege, the situation became so dire that cannibalism threatened to emerge. The Biblical storyteller (2 Kings 6:25) explains:

> And there was a great famine in Samaria: and, behold, they besieged it, until an ass's head was sold for four-score pieces of silver, and the fourth part of a cab of dove's dung for five pieces of silver." (KJV and see below)

For many years, the phrase "dove's dung" attracted the attention of both Jewish scholars as well as modern commentators of the Bible. Still today, most editions of the Bible translate the passage literally, even though "dove's dung" makes little sense in the context as an edible material.

The historian of ancient medicine Rumor (2016, 84) commented on this specific issue: "Incidentally, if doves were flying around and dropping their dung on Samaria, wouldn't it have been more nutritional to eat the birds themselves rather than the dung." Musselman (2012, 52), a well-known researcher of Biblical plants, asked a similar question "If there was an adequate amount of pigeon droppings, why not just eat "the pigeons, a well-known food and a delicacy in parts of the Middle East?."

During the second half of the first century CE Jewish scholar-scribes, known as the Masoretes, placed reading and pronunciation aids in the Hebrew text. Without changing the original text, they indicated the vowels and accent marking thus the differences between "(what is) written" in the consonantal text of the Hebrew text and "(what is) read." This system allowed to add emendations ("written") and corrections ("read") of the biblical text. The original Hebrew "*khiryônîm*" (חריונים) which means feces, a *hapax legomenon*, was replaced by *divyônîm* (דביונים), which

[1]Institute of Evolution and the Department of Evolutionary and Environmental Biology, University of Haifa, Haifa, Israel
[2]Institute for Mediterranean and Near East Languages and Cultures, CSIC, Madrid, Spain

Corresponding Author:
Amots Dafni, Institute of Evolution and the Department of Evolutionary and Environmental Biology, University of Haifa, Haifa, Israel.
Email: adafni@research.haifa.ac.il

means "dove's dung" (see Gordis 1937, 167; Pinker 2009, 106–107). The main views concerning the meaning/identification of *divyônîm*" are as follows:

1. As a substitute for salt. The first century CE Roman-Jewish historian Flavius Josephus posits that the Hebrews bought dove's dung "instead of salt" for five pieces of silver (Wars, 9:4,62).
2. Yona Ibn Janah a Jewish rabbi, physician and Hebrew grammarian active in al-Andalus (990–1055), assumed that dove's dung was used to kindle fire because of the lack of firewood due to the siege (Ibn Janah 1896, 149). The point is that this material is not fit for this purpose (Cizik 1952, 787, an Israeli agronomist).
3. David Kimhi (Radak, 1160–1235), a medieval rabbi, biblical commentator, philosopher and grammarian, and later Levi Ben Gershon, a medieval French Jewish philosopher and Talmudist (Gersonides, 1288–1344) had some difficulty imagining what use dove's dung could serve in a time of famine. They surmise that the doves could not digest all the seeds that they consumed. Thus, undigested seeds could be found in the doves' excrement and were eaten (in the commentary of 2 Kings 6:25).

The Bible scholar Held (1965, 396) posits "The majority of the modern biblical scholars assume that the name of an edible plant must be hidden in (*khiryônîm*). In the literature there are three arguments for considering a specific plant as "dove's dung":

(a) The meaning of the plant name is "doves' dung" or has some similarity to the word "*khiryônîm.*"
(b) The similarity of the plant's colors or its storage organ shape to dove's feces.
(c) Edible plants that were thought to grow near Samaria at this time.

In the literature, the following plants have been suggested as possibly being "dove's dung": *Cicer arienatum*; *Ornithogalum umbellatum*; *Bunium elegans*; *Ceratonia siliqua; Tulipa montana;* and *Prosopis farcta*. In this paper, we examine each of these suggestions, based on a thorough review of ecological data, geographic distribution, lexical evidence, edibility and the different medicinal uses of each of these plants.

Methodology

We reviewed the existing literature on the identification of "dove's dung" drawing upon a great diversity of sources that date from the Middle Ages and Modern times to the most recent publications. First, we assessed the work of biblical scholars and summarized their philological discussions on the term, which include detailed analyses of the correct reading of the Hebrew word and thorough interpretations of its various meanings. In a second step, we surveyed the plant identifications of the Hebrew term and discussed the probability of the identifications, considering the flora of ancient Israel (Zohary 1982; Amar 2012). Each of the plants potentially identified as "dove's dung" were critically examined in light of a broad spectrum of botanical evidence: validity of the identification from a taxonomical viewpoint, relevant characters of each species (e.g., toxicity, edibility, storage organs), as well as ecological demands and their geographic distribution. After assessing the immediate biblical context, we examined the external evidences from ancient Assyria and Babylonia. The reason for that is that the Bible lands do not only form part of the broader ancient Near Eastern world, but also their languages —Hebrew and Akkadian in its Assyrian and Babylonian dialects—are related, both belonging to the Semitic language family. We observed that Bible commentators, few notable exceptions (e.g., Held 1965), have drawn scarcely on the research carried out by scholars specialized in Assyriology or cuneiform studies. We therefore reviewed the Assyriological literature about the Akkadian plant term(s) that have the same meaning as the Hebrew "dove's dung." The cuneiform documents we analyzed, viz. so-called lexical texts, provide a correspondence of the Akkadian name "dove's dung" with a true plant term. This evidence prompted the discussion presented here. The first author (AD) conducted the literature search of the Hebrew sources, and the second author (BB) of classical and cuneiform sources. For the abbreviations of the various editions of the Bible used throughout the contribution, see https://www.biblegateway.com/verse/en/2%20Kings%206%3A25.

Results

In the following we examine each of the plant species that have been identified as "dove's dung," and analyze the empirical foundations of these suggestions.

1. *Cicer arietinum* L. This suggestion was raised several centuries ago by the seventeenth century Oreintalist scholar Bochart (1692, 573), based on the Arabic name of this plant, which means "dove's or sparrow's dung," later it was proven to be a complete mistake (see below). This suggestion was refuted by the eighteenth century Swedish scientist Celsius (1747, 32), who shows that Bochart was mistaken in affirming that the article of food known among the Arabs by the epithet "dove's or sparrow's dung" was pulse or chick-peas; therefore, the connection between the Hebrew and Arabic terms seems ungrounded (see Moldenke and Moldenke 1952, 163) and was rarely considered again as "dove's dung" (but see Farrar 1894, 77).

Thus, it was quite surprising to find Musselman's (2012, 52; 2022, 104) opinion that: "The… choice appears to me to be the most parsimonious and logical. Chickpea, also known as garbanzo bean, is an ancient and well-known crop in the Middle East. When dry, the beans resemble pigeon droppings, a similarity masked in recent years by unfamiliarity with an ancient

strain of the crop." Klingbeil (2014, 251), in his review on Musselman's 2012 book noted: "The entry on 'dove's dung'…is another example of a fascinating discussion providing new light on a difficult text…but (he) ultimately suggests that an ancient variety of dried chickpea (or garbanzo beans), resembling the shape of pigeon droppings would be the most likely logical solution to this conundrum." Smith (2018, 324) comments: "Dove's dung may have been the popular name for some food such as roasted chickpeas."

2. *Ornithogalum umbellatum* L. Linnaeus (1792, 287) suggested that this plant is the dove's dung referred to in the Bible. His arguments are as follows:

1. In Palestine, it grew in great abundance.
2. Owing to the flower which resembles the color of the dung of pigeons and other birds, gray and white dyed, whence the name: the milk of birds (*Ornithogalum*), because of that white color which is excreted with the dung.
3. The root is still eaten in Palestine, among people of low socioeconomic background.

Several authors contributed additional notes on this issue. Obermeyer (1978, 324) continued this line of thought, saying that the scattered white flowers seem, from a distance, to resemble bird droppings. Löw (1928, 601), the rabbi orientalist scholar and botanist, suggested reading and emendating the Hebrew term *khiryônîm* to *ḥarṣonim*. Then, he compares the Hebrew to the Syriac plant name *ḥarṣānā*. This Syriac word appears as a translation of the Greek expression "dove's dung" in the Syriac translation of the text On Simples attributed to Dioscorides (Dioscorides 1829, 173; Fitch 2022). Löw agrees with Linnaeus that Dove's dung is, in fact, the plant *Ornithogalum*.

Smith (1814, 130) noted that "If Linnaeus is right, we obtain a sort of clue to the derivation of *Ornithogalum* (birds' milk), which has puzzled all the philologists. May not this observation apply to the white fluid which always accompanies the dung of birds, and is their urine? One may almost perceive a similar combination of colors in the green and white of this flower, which accords precisely in this respect with the description which Dioscorides gives of his *Ornithogalum*."

Boswell, Lankester and Sowerby (1873, 197) are more skeptical: "Linnaeus and other botanists have imagined that this plant was the substrate mentioned in 2 Kings 6:25. There does not, however, appear to be much evidence in support of this opinion."

Several authors who wrote about "Biblical botany" considered *O. umbellatum* as the most plausible possibility for dove's dung, mainly repeating Linnaeus' and Sprengel's arguments and each other, without critical reservations (Callcott 1842, 129–131; Tyas 1851, 86–87; Kitto 1862, 697–698; Post 1883, 801; Moldenke and Moldenke 1952, 162–193; Harrison 1966, 32; Jensen 2012, 48–49). Very few English translations were influenced by Linnaeus (NJB, JB, GB) and translated "dove's dung" as "wild onion."

Ornithogalum umbellatum—this plant is collected as an edible plant in several countries (Jordan: Al-Qura'n 2005, 126; Turkey: Ozbucak et al. 2006; Iraqi Kurdistan: Hosseini et al. 2022). This plant was reported to be a toxic species in the literature (Elias and Dykeman 2009) and contains cardiac glycosides (Diaz 2016, 140). The bulb of *O. umbellatum* is toxic for animals (Villar, Sesé and Fernández 2001; Mateos and Álvarez 2010), but once boiled or roasted it loses its toxicity (Texidor 1871) and is suitable for human consumption. For this reason, caution should be exercised in its consumption (Üstün et al. 2018, 87). We were unable to find any record about its current use as an edible plant today in the Holy Land. Since the bulb needs boiling before human consumption, it is hard to imagine that under such a severe siege people had enough firewood to prepare the bulbs for eating.

E. Hareuveni (1947, 129), the first Israeli ethnobotanist, commented that no part of this plant resembles pigeon dung, and the bulbs are small with many smaller bulbils around. The main bulbs are quite small (up to 2–3 cm in diameter) and so it is hard to collect reasonable quantities sufficient as food. Today it is a rare plant which only grows in cultivated fields in Samaria (Feinbrun-Dothan and Danin, 1991, 783). According to the current taxonomy (POWO), the local species is *Ornithogalum divergens* Boreau (= *O. umbellatum* subsp. *divergens* Boreau Asch. & Graebn).

3. *Bunium elegans* (Fenzl) Freyn: E. Hareuveni (1947, 129) suggested that "dove's dung" was actually *B. elegans*. His arguments are as follows: Its corm is like a small potato. In its size and shape it reminds the form of pigeon feces—and thus the name "dove's dung" fits this plant. Sometimes it is eaten roasted by the field owner or his children. But in famine years, it was sought for and even sold as told in 2 Kings 5:26. This species is not included in the flora of the Holy Land at all (Feinbrun-Dothan and Danin 1991). N. Hareuveni (n.d., 26) also repeated this idea (without indicating any scientific name of the plant) and provides a photo of *Astomaea seselifolia* (DC.) Rauschert (=*Astoma seselifolium* DC.).

This species is collected as an edible plant in Jordan (Tukan, Takruri and Al-Eisawi 1998, 230) as well as by the Bedouins in the Middle East (Abu-Rabia 2014, 30). It is eaten fresh, roasted, or cooked.

Regarding dove's dung, Keel (1989, 121) says in his commentary on Kings: "Some hypothesize that the intention relates to an edible plant that is consumed in difficult times (*Bunium elegans*)."

Astomaea seselifolia—This plant never appears in large populations (although it grows in fields near Samaria, Feinbrun-Dothan and Danin 1991, 474), the corms are quite small (2–4 cm), and are hidden at a depth up to 20 cm. Thus, it seems that it would be a hard job to collect a decent amount of this plant as a substitute for a portion of a staple food.

4. Ceratonia siliqua L.: Based on a philological analysis of Isaiah 36:12, Cheyne (1899, 33) decided that "dove's dung" is the carob pod. His suggestion, based upon an emendation of the Hebrew, was rejected by Gordis (1937, 167). The Assyriologist Campbell-Thompson (1949, 186), one of the pioneers in the study of cuneiform medicine and botany, proposed on the basis of lexical cuneiform sources that "dove's dung" may be the "seed of ašāgu," that is, a carob-seed, based on his incorrect identification of *ašāgu* as carob.

Cogan and Tadmor (1988, 79), who wrote the commentary on the Book of Kings, stated that: "Dove's dung has to be identified as inedible husks of either a carob or another plant." And in a footnote on the same page (Cogan and Tadmor 1988, 79 footnote 25): Follow the Akkadian evidence: in a lexicalist of plants, *halla/ze summati*, "dove's dung" is defined as *zer asagi* = *ḫarūbu*, the seed of the false carob. It seems that they didn't differentiate between the carob and the "false carob," the Syrian Mesquite (*Prosopis farcta*). Later, it was designated by Kogan (1990, 23) only as a "carob seed": "…. *khiryônîm*, literally 'dove's dung', turns out to be 'carob seed', learned from an Akkadian lexical list where this same colorful epithet appears."

We are aware of only one translation into English, which translated "dove's dung" as "locust bean" (= carob, NEB). The New Jewish Publication Society, which was in charge of the 1985 translation of the Holy Scripture, translated "dove's dung," but added a footnote (p. 575): "Apparently a popular name for 'carob pods', as in Akkadian."

Greenfield, Garrone and Soggin (1991, 121, following Cogan and Tadmor (1988, 79) states: "The words 'dove's dung' have been recognized as a term used for carobs."

It should be noted that there is no ancient translation (from the Old Testament) that identifies any tree with the carob (Amar 2012, 245). According to Guest and Townsend (1966, 24–25), *Ceratonia siliqua* is a Mediterranean tree and is only occasionally cultivated in Iraq. It does not grow wild in Iraq (Browicz 1983, 21–22) which makes the identification suggested by Thompson rather unlikely.

5. *Tulipa montana* Lindl.: Cizik (1952, 786), following Hooper and Field (1937, 183), mentioned that bulbs of this species were sold in the market of Mosul (Iraq) as food under the name "Fraiyonah." He commented: "It seems that in the past the roasted bulbs were named "*khiryônîm."*

This species is not a native species and we are not aware of any local edible species of *Tulipa*.

6. ***Prosopis farcta*** **(**Banks. Et Sol.) Mabbride (**=*P. stepahniana*** M. Bieb. (Kunth ex Spreng.): The first one to compare the Hebrew term "*khiryônîm*" with an Akkadian plant name was Oppenheim (1946, 175–176) in his note on 2 Kings 6:25. Discussing the Akkadian term *ḫalla summati*, literally "dove's droppings," which refers to a plant, he suggested interpreting the Hebrew expression *khiryônîm* not in the literal sense, but also as the name of a plant.

According to cuneiform plant glossaries, the term *ḫalla summati* corresponds to the plant name *šammu ēdu,* which has been identified by Campbell-Thompson (1949, 264–265) with *asafetida* (=*Ferula asa-foetida* L.). This identification can neither be corroborated or confirmed.

Held (1965) discusses in detail the correspondence of *khiryônîm* with another Akkadian term, namely *zê summati*, literally "dove's dung," following Landsberger's identification (1937–1939, 139–140) with *P. farcta*. Held corrects the earlier identification of *zê summati* with the seed of the carob tree (*Ceratonia*) by Thompson (1938, 25; repeated in 1949, 186). Böck, Ghazanfar and Nesbitt (2023, 102) adds still another Akkadian name, which refers to the fruit of *P. farcta*, namely *kabut summati,* "dove's feces," which was used synonymously with *zê summati,* "dove's dung."

P. farcta belongs to those plants that have received several Akkadian names. The plant itself is called *ašāgu* in Akkadian, the beans of the plant are called *ḫarūbu.* The term *ḫarūbu* is not the only Akkadian word that refers to the bean. Ancient Mesopotamians used two more names, namely *zê summati "*dove's dung" and *kabut summati "*dove's feces" (see for the discussion of Böck, Ghazanfar and Nesbitt 2023, 100–102). One of the basic problems, which can be observed in the Assyriological literature, is that scholars do not distinguish or are unaware of the difference between the carob (*C. siliqua*) and the false carob *(P. farcta).*

Eph'al (2009, 60. Note 67) realized that according to Held (1965, 395–398) *khiryônîm* is equivalent to *kharuvim* = carobs, as suggested by Cheyne (1899, 33) and it is to be identified with C. *siliqua* L. (Akkadian ḫarūbu, Hebrew *kharuv*), or with *Prosopis stephaniana* [a synonym of *P. farcta*] (also "false carob," [*yanbut*]; Akkadian ašāgu; Arabic *harnub*, *sāuk*). Both species grow in Palestine. The carob, which is native to the same approximate region as the olive, does not grow in the alluvial area of Mesopotamia.

It is noteworthy that in Zohary's (1982) authoritative book as well as that of Felix (1957), "dove's dung" is not mentioned. Amar (2012, 246–247) included "*khiryônîm*" under a specific group of "Names that are dubious as nicknames for plants." Thus, it is not surprising at all that Musselman (2012, 50) concluded: "No Bible vegetable has been subject to such wildly varying interpretation."

Discussion and Conclusions

Most of the English translations, both old and new, consider "*khiryônîm*" as being related to dove's excrement. The most common term is "dove's dung" (AMP, BRG, CSB, CEB, CEV, ERV, EASY, ESV, ESVUK, EXB, GNV, GW, GNT, HCSB, ICB, ISV, KJV, KJ21, JUB, LSB, LEB, NASB, NCB, NCV, NRSVA, NRSVACE, NRSVCE, NRSVUE, OJB, RSV, RSVCE, TLB, TLV, VOICE, WEB, and YLT). Other variation are: "dove's droppings" (EHV, MEV, NABRE, NKJV); "dove manure" (NOG) ; "dove's waste" (NLV); "pigeon droppings" (DARBY) and "pigeon's dung"

(DRA). In very few translations are there terms related to a non-specific plant's material such as: "seed pods" (NIRV, NIV, NIVUK) and "a bowl of field greens" (MSG).

Based on all the literature reviewed, we propose four arguments for the identification of "dove's dung" with the plant species *Prosopis farcta*:

1. Several Biblical plant names certainly share the same Semitic root as the Akkadian terms such as: *Acorus calamus*: Akkadian *qānu tābu* "sweet reed" (Campbell-Thompson 1949, 20; Böck, Ghazanfar and Nesbitt 2023, 163). Amar (2012, 181) considered the identification of the Biblical "*kaneh hatov*" with the Akkadian *qānu tābu* as "of high certainty but not sure"; *Allium sativa*: Hebrew-Shum ((שום; Akkadian: *šūmu* and *Cuminum cyminum* Hebrew—Kamun; Akkadian; *kamūnu.*

It is therefore reasonable to compare Akkadian, "dove's dung" to the Biblical Hebrew cognate *khiryônîm*.

2. *P. farcta* is an edible plant. Guest and Townsend (1966, 41) noted that it was possibly eaten by human beings in times of scarcity. The fruits were dried or roasted prior to consumption. Hence, the Arabic name "*tamir al-fakira*" (= poor woman's date) that was recorded in Syria. The fruits are eaten today in Turkey: "Unripe green fruit is peeled, salted and eaten raw" (Los and Tel 2013, 35; Yalçin, Hasan and Çakilcioğlu 2022, 65; Eksik and Hasan 2023, 68) and in Israel (Berkowitch 2016).
3. It grows in the Samaria area, sometimes in dense populations in valleys (Dafni 1975, 18).
4. The preservation of the ancient Near Eastern medicinal uses of this species—Dafni and Böck (2019) showed that 43 plant species, which are regarded as "Biblical Medicinal plants," were found to have been used continuously since ancient times; in many cases, the same specific uses were preserved. According to Rumor (2016, 80): "In Babylonian medicine the ingredient *Ze summati* (dove's dung) was used for various ailments, and was especially prescribed in cataplasm or lotions to treat various sorts of skin eruptions." Böck, Ghazanfar and Nesbitt (2023, 103) add further medicinal uses according to the cuneiform record: "The internal applications include urinary infections…hemorrhages during pregnancy and toothache."

Most of these applications are still in use today in the Middle East: wound healing and skin problems (Gaza strip: Abou Auda 2011, 3683; Iraq: Akrawi et al. 2021, 2560; Mahmud et al. 2023, 3832; Iran: Solati et al. 2021, 7; Noroozi et al. 2019, 2; Dolatkhahi, Dolatkhahi and Nejad 2014, 406; Miri et al. 2020, 28); febrifuge (Iran: Khajoei Nasab and Esmailpour et al. 2019, 2154); to treat hemorrhoids (Israel: Palevich et al. 1986, 293; Jordan: Qasem 2015, 563; Iran: Miri et al. 2020, 28); toothache (Israel: Palevich et al. 1986, 340; Iran: Miri et al. 2020, 28); urinary tract infections (Palestine: Abu-Rabia 2005, 297; Turkmenistan: Saadati et al. 2023) and as a diuretic (Iran: Miri et al. 2020, 28).

Based on these data and arguments, we suggest that the most plausible candidate for the Biblical "dove's dung" is *Prosopis farcta*. The other suggestions discussed here (*Cicer arienatum*; *Ornithogalum umbellatum*; *Bunium elegans*; *Ceratonia siliqua* and *Tulipa montana*) appear to be ungrounded as they were based on unreliable philological data, the plants are/were not native to the Holy Land, or are not suitable as a substitute for a staple food under siege conditions.

Acknowledgments

The authors want to thank the anonymous reviewers and especially to the *editors* for their constructive comments and critical suggestions which improved this article considerably.

BB's research was funded by the research project PID2021-125678NB-I00.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the BB's research and was funded by the research project PID2021-125678NB-I00.

References

Abou Auda, M. 2011. "An Ethnobotanical Use of Plants in the Middle Area, Gaza Strip, Palestine." *Advances in Environmental Biology* 5: 3681–3688.

Abu-Rabia, A. 2005. "Palestinian Plant Medicines for Treating Renal Disorders: An Inventory and Brief History." *Alternative and Complementary Therapies* 11: 295–300.

Abu-Rabia, A. 2014. "Ethnobotany Among Bedouin Tribes in the Middle East." In *Medicinal and Aromatic Plants of the Middle-East*, edited by Z. Yaniv, and N. Dudai, 27–36. Dordrech: Springer.

Akrawi, S. H., M. Attimarad, B. Al-Dhubaib, K. Saoor, and H. E. Khalil. 2021. "Isolation and Identification of the Chemical Ingredients of Prosopis farcta leaf Extract Using 13 C and ^{1}H-NMR Spectroscopy." *Tropical Journal of Pharmaceutical Research* 20: 2559–2565. https://doi.org/10.4314/tjpr.v20i12.15.

Al-Qura'n, S. 2005. "Ethnobotanical Survey of Folk Toxic Plants in Southern Part of Jordan." *Toxicon* 46: 119–129. https://doi.org/10.1016/j.toxicon.2005.04.010

Amar, Z. 2012. *Plants of the Bible*. Jerusalem: Reuben Mass. in Hebrew.

Ben Gershon, L. (Gersonides). 2012. In *Kings I & II – Mikra'ot Gedolot – 'Haketer'*. Ramat Gan: Bar-Ilan University Press. (In Hebrew).

Berkowitch, A. 2016. "Uses of Prosopis farcta as an Edible and a Medicinal plant." *Kalanit* 3, (In Hebrew). https://www.kalanit.org.il/prosopis-farcta/

Bochart, S. 1692. *Hierozoicon, sive bipartitum opus de animalibus S. Scripturae. Pars secunda. Lugduni Batavorum: Cornelis Boutesteyn and Jordaan Luchtmans; Trajecti ad Rhenum*. Leiden: Guilelmum vander Water.

Böck, B., S. Ghazanfar, and M. Nesbitt. 2023. *An Ancient Mesopotamian Herbal*. Royal Botanic Garden, Kew: Kew Publishing.

Boswell, J. T., M. Lankester, and J. Sowerby. 1873. *English Botany, or, Coloured Figures of British Plants*. Vol. 9, 3rd. London: George Bell and Sons.

Browicz, K. 1983. *Chorology of Trees and Shrubs in South-West Asia and Adjacent Regions*. Warszawa-Poznan: Polish Scientific Publishers.

Callcott, L. M. 1842. *A Scripture Herbal*. London: Longman, Brown, Green, and Longmans.

Campbell-Thompson, R. 1949. *A Dictionary of Assyrian Botany*. London: British Academy.

Celsius, O. 1747. *Hierobotanicon: Sive De Plantis Sacrae Scripturae, Disserationes Breves* (Vol. 2). Upsala: sumtu Auctoris.

Cheyne, T. K. 1899. "Something Better Than Husks." *The Expositor* 55: 32–35.

Cizik, B. 1952. *Otsar Hatsemakhim*. Herzeila, The Author. in Hebrew.

Cogan, M., and H. Tadmor. 1988. *II Kings. A New Translation with Introduction and Commentary. Anchor Bible*. Vol. 11. Garden City, NY: Doubleday.

Dafni, A. 1975. Comparative Biology of Prosopis farcta) Banks et Sol.) Macbride from Different Habitats in Israel. Unpublished Doctoral Dissertation, Department of Botany, Hebrew University of Jerusalem, Jerusalem. (in Hebrew).

Dafni, A., and B. Böck. 2019. "Medicinal Plants of the Bible—Revisited." *Journal of Ethnobiology and Ethnomedicine* 15: 1–14. https://doi.org/10.1186/s13002-019-0338-8

Diaz, J. H. 2016. "Poisoning by Herbs and Plants: Rapid Toxidromic Classification and Diagnosis." *Wilderness and Environmental Medicine* 27: 136–152. https://doi.org/10.1016/j.wem.2015.11.006

Dioscorides, P. 1829. Pedanii Dioscoridis Anazarbei De Materia Medica Libri Quinqué (liber 1), translated by C. Sprengel, prostat in officina Libraria Car. Cnoblochii, Lipsiae.

Dolatkhahi, M., A. Dolatkhahi, and J. B. Nejad. 2014. "Ethnobotanical Study of Medicinal Plants Used in Arjan–Parishan Protected Area in Fars Province of Iran." *Avicenna Journal of Phytomedicine* 4: 402–412. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4224954/pdf/AJP-4-402.pdf

Eksik, C., and A. K. A. N. Hasan. 2023. "A Survey on Edible Plants for Human Consumption in Some Mountainous District of Mardin, Turkey." *Afyon Kocatepe Üniversitesi Fen Ve Mühendislik Bilimleri Dergisi* 23: 555–575. https://doi.org/10.35414/akufemubid.1243148.

Elias, T. S., and P. A. Dykeman. 2009. *Edible Wild Plants: A North American Field Guide to Over 200 Natural Foods*. New York: Sterling.

Eph'al, I. 2009. "The City Besieged: Siege and its Manifestations in the Ancient Near East." *Culture and History of the Ancient Near East*. 36. Brill, Leiden and Boston.

Farrar, D. D. 1894. *The Expositor's Bible, The Second Book of Kings*. London: Hodder & Stoughton.

Feinbrun-Dothan, N., and A. Danin. 1991. *Analytical Flora of Eretz-Israel*. Jerusalem: Cana. in Hebrew.

Felix, J. 1957. *Plant world of the Bible*. Tel Aviv: Massada. in Hebrew.

Fitch, J. G. 2022. *On Simples, Attributed to Diocorides*. Leiden, Boston: Brill.

Gordis, R. 1937. *The Biblical Text in the Making: A Study of the Kethib-Qere*. Philadelphia: The Dropsie College for Hebrew and Cognate Learning.

Greenfield, J. C., D. Garrone, and J. A. Soggin. 1991. "Doves' Dung and the Price of Food: The Topoi of II Kings 6: 24-7: 2." In *Storia e Tradizioni di Israele. Scritti in Onore di J. Alberto Soggin*, edited by D. Garrone, and F. Israel, 121–126. Brescia: Paideia.

Guest, E., and C. C. Townsend. 1966. *Flora of Iraq: Leguminales*. Vol. 3. Bagdad: Ministry of Agriculture of the Republic of Iraq.

Hareuveni, E. 1947. Me'olam Hatsomeakh Shel Hatanakh (From the Vegetation World of the Bible). Report, World Congress of Jewish Studies, Jerusalem vol. 1, pp. 128–188. (in Hebrew).

Hareuveni, N. n.d. *Khinukh Sade. 2 (Field Education)*. Tel Aviv: Israeli Army Department of Education. in Hebrew.

Harrison, R. K. 1966. *Healing Herbs of the Bible*. Leiden: Brill.

Held, M. 1965. "Studies in Comparative Semitic Lexicography." In *Studies in Honor of Benno Landsberger on his Seventy-Fifth Birthday*, edited by H. G. Guterbock, and T. Jacobsen. Vol. 16, 395–406. Chicago: The Oriental Institute of Assyriological Studies.

Hooper, D., and H. Field. 1937. "Useful Plants and Drugs of Iran and Iraq." *Field Museum of Natural History*. Vol. 9, 74–216. Botanical Series. Chicago: Field Museum of Natural History.

Hosseini, S. H., Z. Sadeghi, S. V. Hosseini, and R. W. Bussmann. 2022. "Ethnopharmacological Study of Medicinal Plants in Sarvabad, Kurdistan Province, Iran." *Journal of Ethnopharmacology* 288: 114985. https://doi.org/10.1016/j.jep.2022.114985.

Ibn Janah, Y. 1896. *Sefer Haschoraschim*. Berlin: M'Kize Nirdamim. in Hebrew.

Jensen, H. A. 2012. *Plant World of the Bible*. Bloomington: Author House.

Josephus, F. 2012. *The Great Roman-Jewish War*. North Chelmsford, Massachusetts: Courier Corporation.

Keel, J. 1989. *Sefer Melachim Meforash (A Commentary to Kings)*. Jerusalem: HaRav Kook. in Hebrew.

Khajoei Nasab, F., and M. Esmailpour. 2019. "Ethno-medicinal Survey on Weed Plants in Agro-Ecosystems: A Case Study in Jahrom, Iran." *Environment, Development and Sustainability* 21: 2145–2164. https://doi.org/10.1007/s10668-018-0128-9.

Kimhi, D. (Radak) 2012. In *Kings I & II – Mikra'ot Gedolot – 'Haketer'*. Ramat Gan: Bar-Ilan University Press. in Hebrew.

Kitto, J. 1862. *A Cyclopaedia of Biblical Literature*, edited by W.L. Alexander Adam and Charles. Vol. 1. Edinburgh: Black.

Klingbeil, G. A. 2014. "A Dictionary of Bible Plants." *Biblical Research* 24: 250–251.

Kogan, M., 1990. Through the Commentator's Looking Glass and What He Found There. In Proceedings of the tenth World Congress of Jewish Studies. Div. A: The Bible and its world. Jerusalem, August 16–24, 1989, 21–28.

Landsberger, B. 1937–1939 (with G, Meier). "Keilschrifttexte Nach Kopien von T. G. Pinches. Aus dem Nachlass Veröffentlicht und Bearbeitet", *Arhciv für Orientforschung* 12: 135–144.

Linnaeus, C. 1792. *Praelectiones in ordines naturales plantarum*, edited by P.D. Giseke, Benj. Gottl. Hamburg: Hoffmanni.

Los, M. M., and A. Z. Tel. 2013. "The Ethnobotany of Some Legume Plants Around Birecik Şanliurfa." *Adyutayam Dergisi* 1: 31–39. https://dergipark.org.tr/en/download/article-file/1673091

Löw, I. 1928. *Die Flora der Juden*. Vol. 1. Wien and Leipzig: Alexander Kohut Memorial Foundation.

Mahmud, S. O., Z. A. Amin, S. M. Nuraddin, and M. A. Alshawsh. 2023. "Antioxidant and Wound Healing Properties of Prosopis Farcta and Adiantum Capillus Plant Extracts: An In Vitro Study." *Journal of Pharmaceutical Negative Results* 14: 3831–3839. https://doi.org/10.47750/pnr.2023.14.03.480.

Mateos, J., and M. A. Álvarez. 2010. *Plantas tóxicas españolas. Clave rápida de asistencia al diagnóstico*. Madrid: Ministerio de Medio Ambiente y Medio Rural y Marino & Real Academia de Ciencias Veterinarias.

Miri, A., M. Khatami, O. Ebrahimy, and M. Sarani. 2020. "Cytotoxic and Antifungal Studies of Biosynthesized Zinc Oxide Nanoparticles Using Extract of Prosopis farcta Fruit." *Green Chemistry Letters and Reviews* 13: 27–33. https://doi.org/10.1080/17518253.2020.1717005.

Moldenke, H. N., and A. L. Moldenke. 1952. *Plants of the Bible*. New York: Ronald Press.

Musselman, L. J. 2012. *A dictionary of Bible plants*. Cambridge: Cambridge University Press.

Musselman, L. J. 2022. *Solomon Described Plants: A Botanical Guide to Plant Life in the Bible*. Eugene, Oregon: Wipf and Stock Publishers.

Noroozi, R., E. Sadeghi, H. Yousefi, M. Taheri, P. Sarabi, A. Dowati, S. A. Ayatallahi, R. Noroozi, and S. Ghafouri-Fard. 2019. "Wound Healing Features of Prosopis farcta: In Vitro Evaluation of Antibacterial, Antioxidant, Proliferative and Angiogenic Properties." *Gene Reports* 17: 100482. https://doi.org/10.1016/j.genrep.2019.100482.

Obermeyer, A. A. 1978. "Ornithogalum: A Revision of the Southern African Species." *Bothalia* 12: 323–376.

Oppenheim, A. L. 1946. "Assyriological Notes to the Old Testament." *Jewish Quarterly Review* 37: 175–176.

Ozbucak, T. B., H. G. Kutbay, and O. E. Akcin. 2006. "The Contribution of Wild Edible Plants to Human Nutrition in the Black Sea Region of Turkey." *Ethnobotanical Leaflets* 10: 98–103.

Palevich, D., Z. Yaniv, A. Dafni, and J. Friedman. 1986. "Medicinal Plants of Israel: An Ethnobotanical Survey." *Herbs, Spices, and Medicinal Plants: Recent Advances in Botany, Horticulture and Pharmacology* 1: 281–345.

Pinker, A. 2009. "On the Meaning of šgl." *Jewish Studies, an Internet Journal* 8: 167–182.

Post, G. E. 1883. *Flora of Syria, Palestine and Sinai: From the Taurus to Ras Muhammad and From the Mediterranean Sea to the Syrian Desert*. 1st ed. Beirut: Syrian Protestant College.

POWO n.d. Ornithogalum umbellatum L. https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:539600-1 (visited 27.3.24)

Qasem, J. R. 2015. "Prospects of Wild Medicinal and Industrial Plants of Saline Habitats in the Jordan Valley." *Pakistan Journal of Botany* 47: 551–570.

Rumor, M. 2016. "Babylonian Pharmacology in Graeco-Roman Dreckapotheke With an Edition of Uruanna III 1-143 (138)." Unpublished Doctoral Dissertation, Freie Universität Berlin, Berlin.

Saadati, R., A. Sattarian, A. Daneshvar, and E. Amini. 2023. "Ethnobotanical Study (with Emphasis on Medicinal Uses) on Eastern Golestan Province (Turkmen Tribes) Plants." *Iranian Journal of Medicinal and Aromatic Plants Research* 39: 16–37. In Farsi. https://doi.org/10.22092/ijmapr.2022.359406.3208

Smith, J. E. 1814. *English Botany; or, Coloured Figures of British Plants, with Their Essential Characters, Synonyms, and Places of Growth: to which Will be Added, Occasional Remarks*. London: James Sowerby.

Smith, J. E. 2018. *1&2 Kings, A Commentary*. Raleigh, NC: Lulu.com.

Solati, K., M. Karimi, M. Rafieian-Kopaei, N. Abbasi, S. Abbaszadeh, and M. Bahmani. 2021. "Phytotherapy for Wound Healing: The Most Important Herbal Plants in Wound Healing Based on Iranian Ethnobotanical Documents." *Mini Reviews in Medicinal Chemistry* 21: 500–519. https://doi.org/10.2174/1389557520666201119122608.

Texidor, J. 1871. *Flora farmacéutica de España y Portugal*. Madrid: J.M. Ducazcal Imprenta.

Thompson, R. C. 1938. "The Assyrian Kisal as the Origin of the Carat-Weight." *Iraq* 5: 23–30. https://doi.org/10.2307/4241619.

Tukan, S. K., H. R. Takruri, and D. M. Al-Eisawi. 1998. "The Use of Wild Edible Plants in the Jordanian Diet." *International Journal of Food Sciences and Nutrition* 49: 225–235. https://doi.org/10.3109/09637489809086416.

Tyas, R. 1851. *Flowers From the Holy Land; Being an Account of the Chief Plants Named in Scripture*. London: Houlston and Stoneman.

Üstün, N. Ş., A. Pekşen, S. Bulam, and H. Duran. 2018. "Edible Wild Herbaceous Plants Consumed in Giresun Province." *Acta Biologica Turcica* 32: 84–89. https://www.actabiologicaturcica.com/index.php/abt/article/viewFile/201/815

Villar, L., J. A. Sesé, and J. V. Fernández. 2001. *Atlas de la Flora del Pirineo Aragonés, Vol. II (Pyrolaceae-Orchidaceae)*. Huesca: Consejo de Protección de la Naturaleza de Aragón & Instituto de Estudios Altoaragoneses.

Yalçin, S., A. K. A. N. Hasan, and U. Çakilcioğlu. 2022. "Traditional Uses of Some Food Plants in Suruç (Şanliurfa, Turkey)." *Türk Doğa ve Fen Dergis* 11: 59–65. https://doi.org/10.46810/tdfd.956778.

Zohary, M. 1982. *Plants of the Bible*. Cambridge: Cambridge University Press.